Year 2000 Synergy Projects
Shoreline Digital Data

Definition of the Problem

Shoreline data play a fundamental role in the National Ocean Service (NOS) mission of coastal stewardship and safe navigation. Digital shoreline data are used throughout the entire organization. Shoreline is a critical element on paper and electronic nautical charts. Shoreline is also a framework data set for states in the areas of coastal and ocean management and serves as a jurisdictional boundary in most cases. The digital shoreline provides the basis for trend analysis to help understand the changing environment. The digital shoreline is also a key data layer in response and restoration operations. Figure 1 describes part of the shoreline data flow within NOS. The original data that are useful to all of the NOS line offices require conversion from one format to another in order to meet multiple agency requirements. Many of the legacy systems are in jeopardy of losing entire elements of historical shoreline data, due to their advanced age.

NOS customers must be able to easily access shoreline products needed for coastal and ocean science, management, navigation, positioning, restoration, and response.

As a result of the converging technologies of geographic information systems (GIS), global positioning systems (GPS), and the Internet, NOS customers are demanding access to timely, digital vector shoreline. NOS is not currently providing this product. Moreover, NOS no longer coordinates with the USGS with respest to shoreline data. This results in the two national mapping agencies, the NOAA/NOS and USGS, presenting incompatible and often inconsistent map series to the general public. In addition, an MOU is currently in place with the Minerals Management Service (MMS) to cooperate on mapping the U.S. baseline (base points from which the Territorial Sea is measured). NOS has been unable to fully support that MOU due to these policy and technical challenges with shoreline mapping.

Internally, NOS shoreline data are housed in various proprietary formats and media, relatively undocumented and not easily accessed. With support from the NOAA ESDIM office, a small percentage of the historical shoreline data is slowly being made available (see Figure 1), but the process of getting shoreline data to the end user is time consuming and cumbersome.

With respect to data collection, NOS has begun over the past year to research emerging technologies for shoreline mapping. Synthetic Aperture Radar (SAR) has received special attention and holds significant promise. Clearly, traditional procedures for mapping the shoreline are no longer cost-effective for meeting NOS' shoreline mapping requirements.

Compliance with *Executive Order 12906:*

As a direct outcome of the National Partnership for Reinventing Government (National Performance Review), President Clinton signed *Executive Order 12906* in April 1996. This Executive Order created the National Spatial Data Infrastructure (NSDI) and the oversight organization called the Federal Geographic Data Committee (FGDC). As outlined in *Executive Order 12906*, federal agencies were given one year to develop a plan to have their spatial data documented and accessible and to begin implementation of that plan. As an unfunded mandate, there has been little NOS progress in meeting the objectives of this Executive Order.

Strategy for a Digital Shoreline Initiative

Objectives:
Deliver a digital vector shoreline that is current, accurate, GIS-compatible, easily accessible, in standard format and with metadata to all NOS customers.

- Take the National Leadership role in providing the Nation with the definitive, maintained digital shoreline data base.
- Achieve compliance with *Executive Order 12906* with regard to digital shoreline data.
- Coordinate with USGS and other federal agencies to ensure a singular representation of the shoreline on all national map and chart series.
- Invest in research and development (R&D) for new shoreline characterization technologies, conduct cost-benefit comparisons of technologies relative to stated needs, and incorporate new systems into the production process.

Strategic Overview:
To accomplish these objectives, NOS will focus on the products customers want and get the data documented and out in a timely fashion. The FGDC documentation and standards activities on shoreline will receive the input and full cooperation of the organization. Modern GIS-capabilities will be utilized at the beginning of the data creation process . A priority will be placed on R&D, leading to the identification, prototyping, tasking, certifying, and incorporating of new and underutilized technologies for efficiently mapping the shoreline. Current technologies under investigation and development show great potential for addressing multiple shoreline information needs with effectiveness, accuracy and repeatability.

Lastly, NOS is committed to engaging other agencies with interests or responsibilities in the shoreline environment. This will ensure that policies, standards, information, collection, and products address common objectives and make the most effective use of taxpayer investments.

Preferred Outcomes:
Fiscal Year 1999

- Designate NOS shoreline data leadership to direct activity.
- Establish NOS shoreline working group (from all relevant offices)
- Inventory existing NOS shoreline data resources; put information in one accessible shoreline resource database; set procedures for updates of this database.
- Identify NOS shoreline data requirements, develop a process for prioritizing those requirements, and provide findings and recommendations to the SMC.
- Work with external partners and continue the ESDIM projects to make historical data accessible in standard formats with metadata.
- Begin a collaborative R&D process to find new shoreline mapping methods that are cost effective and timely.
- Reestablish external partnerships with MMS and USGS on shoreline mapping.
- Establish an interagency shoreline mapping working group.
- Complete FGDC Shoreline Data Content Standard.

FY 2000 and beyond

- Compile a comprehensive list of requirements necessary to meet objectives.
- Establish GIS expertise within the National Geodetic Survey (NGS) Remote Sensing Division.
- Rework photogrammetric data stream (Remote Sensing Div.) to collect GIS-compatible data suitable for nautical charting, electronic nautical charting, and GIS.
- Incorporate new shoreline data collection processes into the data stream.
- Establish a system for identifying NOS-wide shoreline mapping priorities.
- Continue the effort to clean, reformat, document, and make accessible historical shoreline data.